

SPECIFICATION AMENDMENTS[mja1]

Please add the following paragraph between current paragraphs [0018] and before the

Detailed Description:

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[0018A] FIG. 4 shows a cross-section view along the line A—A of FIG. 1 of a preferred embodiment of the invention.

Furthermore, please amend paragraphs as indicated below, as follows:

C2
[0019] The transportable storage system of the present invention comprises a flexible, collapsible bladder (1), preferably cylindrical in shape, having an orifice at each end thereof, with a flexible diaphragm [(2)] incorporated within said bladder and extending continuously from a portion of the interior layer of said bladder, as further described hereinafter. The system of the present invention further comprises pressure means (3) for injecting and releasing compressed air, gas or fluid to and from a first end of the bladder (1), and injection and expulsion means (4) for injecting and expelling liquids or semi-liquids stored in a second end of the bladder (1), with the diaphragm [(2)] defining the first and second ends of the bladder (1), and separating the gases or fluids stored or used in each such end.

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[0021] The bladder (1) has at least two layers of rubber or other flexible material as described above, an exterior layer (1A) manufactured from a material sufficiently strong to protect the system in transportation and use, and an interior layer (1B) manufactured from a material impervious to and not subject to corrosion by the gasses or fluids intended to be stored or used in the respective ends of the bladder (1). As will be evident from the description of the diaphragm (2) of the present invention below, ~~t~~The interior layer (1B) has a first interior layer (1B1) and a second interior layer (1B2). The second interior layer (1B2) is bonded to the exterior layer (1A). The first interior layer (1B1) is partially bonded affixed to said second interior layer, with the unbonded portions of said first interior layer forming and forms the first end of the bladder (1) and from which the diaphragm (2) extends free from the bladder (1), and a second interior layer (1B2) which is bonded to the affixed portion of the first interior layer and further forms the interior layer of the second end of the bladder (1). Thus, the second interior layer (1B2) and the exterior of the diaphragm define the second end of the interior of the bladder (1), and the first interior layer (1B1) and the interior of the diaphragm define the first end of the interior of the bladder.[[;e]] Except as necessary to distinguish these interior layers, both shall be referred to herein as the interior layer (1B) of the bladder (1).

[0022] One intended use of the system of the present invention is to store and transport petroleum based liquids or semi-liquids, with possible means of transportation by air, where the system is transported to location and dropped around twenty feet to the ground. The system may be further transported on the ground prior to and after use. It is anticipated that the system may be subject to temperature ranges from -25.degree. F. to +140.degree. F. It is further intended that compressed air shall be used in the first end of the bladder to cause the diaphragm to inflate and deflate as

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hereinafter described. With these specifications in mind, ~~your~~ the inventor prefers to use neoprene for the bladder exterior (1A), and nitrile rubber for the bladder interior (1B). It is well known in the art that neoprene is a weather resistant, durable material, sufficient to withstand the foregoing conditions, and that nitrile rubber is impervious to, and not subject to corrosion by, petroleum based substances or pressurized air, and that both materials are sufficiently flexible and collapsible for purposes of the system of the present invention.

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[0026] Where different types of material are used to form the bladder interior (1B) and the bladder exterior (1A), and where the materials used do not naturally bond together when cured, it will be necessary to use a bonding rubber or other material between the layers of the bladder (1) to facilitate the bonding thereof. In ~~your~~ the inventor's preferred system, nitrile rubber and neoprene do not naturally bond together when cured and therefore ~~your~~ the inventor prefers to place a layer of tygum between the bladder interior (1B) and the bladder exterior (1A), to facilitate the bonding thereof. It would be obvious to one skilled in the art to use other suitable bonding materials, if any, depending on the materials used in the manufacture of the bladder (1).

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[0028] When necessary to strengthen the bladder (1) based upon the intended use of the system and/or the type(s) of material used in the manufacture of the bladder (1), at least one layer of fiber (1C) may need to be wound between the interior (1B) and exterior (1A) layers of the bladder (1). In the preferred system described above, ~~your~~ the inventor prefers to wind Easter Weld III Treated Polyester, a polyester fiber coated with resin, around substantially all of the exterior of the interior layer (1B) of the bladder (1) in a cross-hatch pattern, at a first angle to the longitudinal axis of the bladder (1) to control longitudinal expansion, and at a second angle to the latitudinal axis of the bladder (1) to control diametric expansion. The angles of the wind vary depending on the size and shape of the bladder (1), and are typically determined by the filament winding machine used to wind the fiber on the bladder interior (1B). Additional layers of fiber can be wound around the interior (1B) of the bladder for added strength. The resin of the preferred fiber causes it to adhere to the interior layer (1B) of the bladder (1) and the bonding layer, or if no such layer is present, the exterior layer (1A) of the bladder (1), as described above before the bladder is cured. It would be obvious to one skilled in the art that other strengthening materials could be used in the present invention provided that they do not compromise the flexible and collapsible qualities thereof and do not interfere with the bonding of the interior (1B) and exterior (1A) layers of the bladder (1).

[0029] The bladder (1) of the present invention is constructed with a flexible, internal diaphragm [(2)], defining the first and second ends of the bladder, which diaphragm [(2)] extends from the first interior layer (1B) of the bladder (1) and is capable of expanding to substantially the same shape and size of the second end of the bladder (1). The diaphragm is preferably manufactured from the same material as the interior layer of the bladder (1). ~~Your~~ The inventor prefers that the diaphragm [(2)] extend from the bladder (1) along the longitudinal circumference of the bladder (1), at the latitudinal center of the bladder, as depicted in the figures; however, it would be understood by one skilled in the art that the diaphragm may be positioned differently within the bladder (1). The diaphragm [(2)] is capable of expanding to a concave position within the bladder

(1) when the bladder is empty (see FIG. 1), a convex position when the bladder is full (see FIG. 3) or any other intermediate position when the bladder is partially filled (see FIG. 2).

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[0030] The system of the present invention further comprises pressure means (3) affixed to the first end of the bladder (1), controlling the flow of compressed air, gas or fluid into and from the first end of the bladder (1). The pressure means preferably comprises a first rigid plate (3A) affixed to the interior of the first end of the bladder (1), and a second rigid plate (3B) affixed to the exterior of the first end of the bladder (1) and the first rigid plate (3A), each of said plates having an orifice, said orifices being aligned with the orifice of the first end of the bladder. In order to facilitate the affixation of said plates (3A) and (3B) to each other and to the bladder, ~~your~~ the inventor prefers to incorporate on the face of the first plate (3A) a hollow threaded stub (3C), and to drill a corresponding threaded hole in the second plate (3B), permitting the second plate (3B) to screw onto the stub (3C), thereby securing the plates to one another and to the bladder (1). Additionally, the plates are each preferably secured to the bladder (1) using a standard adhesive compatible with the materials of the bladder and the plates. Standard thread sealant is preferably applied to the threads of the threaded stub (3C) prior to screwing on the second plate (3B) to prohibit the gas or liquid used in the first end of the bladder (1) from leaking in use.

[0031] Said pressure means (3) further comprises an intake nozzle (3D) which ~~your~~ the inventor prefers to affix to the exposed end of the threaded stub (3C) in the preferred embodiment, such that when the plates (3A) and (3B) are affixed to one another and the bladder (1), a portion of said threaded stub (3C) and intake nozzle (3D) and threaded stub (3C) extends beyond the outer or exposed face of the second plate (3B). A dust cap may be placed on the intake nozzle (3D) to protect the same during transport. Optionally, an open cylinder may be concentrically affixed to the face of the second plate (3B), extending from the exterior of the bladder (1) and beyond the end of the intake nozzle (3D), to protect the same during transport and use.

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[0033] Depending on the components of the fluid injection and expulsion means (4) as hereinafter described, it may be necessary or desirable to regulate the internal pressure of the first end of the bladder (1). For example, ~~your~~ the inventor has found that standard fuel hoses can be subjected to a maximum of 20 psi. ~~Your~~ The inventor prefers to regulate the internal pressure of the bladder (1), when necessary, by means of a standard pressure regulator coupled with the intake nozzle (3D).

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[0036] The fluid means (4) of the present invention further preferably comprises a removable fuel hose or similar discharge equipment, which is capable of engaging with the nipple (4D) and male quick disconnect (4E) by means of a female quick disconnect (4F). In ~~your~~ the inventor's preferred embodiment, the female quick disconnect is affixed to a close nipple, which in turn is affixed to a reducing bushing, and finally which bushing is affixed to a camlock that engages with the discharge equipment. Based upon limitations of the fuel hose preferred by ~~your~~ the inventor, the system of the preferred embodiment of the present invention is capable of expelling liquid at a pressure preferably of no greater than 20 psi.

[0038] The method and specifics of manufacture of the present invention depends upon the size of the bladder (1), and the materials and components used to manufacture the bladder (1). Generally, the material used to manufacture the first layer of the interior of the bladder (1) and corresponding diaphragm [(2)] is laid on a mandrel shaped to the intended ultimate size of the bladder (1). The second layer of the interior of the bladder (1) is then laid on top of the first layer, with a material placed between the diaphragm [(2)] and the corresponding second end of the interior of the bladder (1), so that when the layers of the interior of the bladder (1) are cured together (as hereinafter described), the diaphragm [(2)] is free from the interior of the bladder (1). If desired, a layer of fiber (1C) is wound around the second interior layer of the bladder (1) followed by a layer of bonding rubber or other material, as described above. Finally, the material forming the exterior of the bladder (1) is placed on top of the previously laid materials and the entire unit is bonded in a pressure/heat chamber in accordance with temperature, time and pressure as is necessary to cause the various layers of the bladder to bond together. Once bonded, the bladder is removed from the mandrel, the material between the diaphragm [(2)] and the second layer of the interior of the bladder is removed, and the pressure means and fluid injection and expulsion means are assembled and affixed to the bladder.

[0039] In practice, with the first end of the bladder (1) substantially empty or with the intake nozzle (3D) open to allow free expulsion of air or fluid from the first end of the bladder (1), the second end of the bladder (1) is filled with the desired gas, liquid or semi-liquid by means of a pump or other injection system. The system of the present invention is then transported to location and a portable air or liquid compressor tank is connected to the intake nozzle (3) and a fuel hose is connected to the nipple (4D). The compressor then injects air or liquid into the first end of the bladder (1), causing the diaphragm [(2)] to expand within the bladder (1), placing pressure on the substance stored in the second end of the bladder (1). When the fuel hose is engaged and open, the substance stored in the second end of the bladder (1) is discharged through the hose. The preferred regulator will limit the pressure in the first end of the bladder. After a desired amount of the stored liquid has been dispensed from the system, the air can be released from the diaphragm [(1)] through the intake nozzle. When empty, the system can be folded up for compact storage and transport.